

**iCal4j**

# **iCal4j @ Calconnect**

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# iCal4j – About Me

- Bsc. CS (Honours) – Graduated 1996
- Software Consultant (Java)
- Singapore, London, Sydney and Melbourne
- Multiple email / calendaring archives in proprietary formats
- In search of a better way

# iCal4j – Open Standards

- Lock-in associated with proprietary file formats
- Long-term archival (> 1 year) requires open standards
- In the Java world:
  - Email => JavaMail
  - Calendar => ???
- iCal4j born, April 2004

# iCal4j – Open Source

- Increasing acceptance in enterprise projects
- Support via online communities
- Access to source code provides improved debugging
- A greater pool of expertise
- A chance to give something back

# iCal4j – Goals

- An object model representation of iCalendar
- Parse and generate ICS files
- Validation, recurrences, timezones, iTIP, ...
- Maintain a “soft touch” approach to object models

# iCal4j – Goals (Cont.)

- An online community to assist with testing, patches, etc.
- Open Leadership
  - “Good leaders do not make decisions - they simply help the community to make better decisions.” - Factory City (<http://factoryjoe.com/blog>)

# iCal4j – Achievements

- Wide-spread adoption
- Bedework, Zimbra, Chandler Server, ...
- Increasing community support
- Members include Bedework (RPI), OSAF, Sun, ...

# iCal4j – Challenges

- Time (or lack thereof)
- Ambiguous specifications (RFC2445, 2446, ..)
- Not all iCalendar implementations created equal
- Strict implementation leads to interoperability issues

# iCal4j – Compatibility Hints

Hints enabled in three ways:

- Programmatically (Application-specific)
- File-based configuration (Application-specific)
- System properties (JVM-specific)

# iCal4j – Compatibility Hints

## Relaxed Unfolding

- <CR>+<LF>+<SPACE> - default fold
- <LF>+<SPACE> - Mozilla Calendar/Sunbird, KOrganizer
- <CR>+<LF>+<TAB> - Outlook 2007
- <LF>+<TAB> - Outlook 2007 (Unconfirmed)

# iCal4j – Compatibility Hints

## Relaxed Parsing

- TZID parameters specified where not applicable
- Extended components/properties/parameters not starting with the required "X-"
- Invalid URI format
- Invalid DATE/DATE-TIME formats
  - “20090204” => “20090204T000000”
- Global TZIDs without a corresponding VTIMEZONE definition
  - ["/mozilla.org/20080911/America/New\\_York"](https://mozilla.org/20080911/America/New_York)

# iCal4j – Compatibility Hints

## Relaxed Validation

- Allow VTODO Components to be published alongside VEVENTs
- Allow publishing VEVENTs that do not specify an ATTENDEE, ORGANIZER and/or SUMMARY property
- Allow VEVENT request that does not specify an ATTENDEE property
- Allow publishing VTODOs that do not specify an ORGANIZER and/or PRIORITY property

# iCal4j – Compatibility Hints

## Relaxed Validation (Cont.)

- Allow components that do not specify a UID and/or DTSTAMP property
- Allow experimental components/properties with names not beginning with "X-"

# iCal4j – Compatibility Hints

## Outlook Compatibility

- Default fold length is 73 characters
- Enforce a fold of 75 characters when hint enabled
- RECUR: Strip whitespace from week day lists

# iCal4j – Compatibility Hints

## Notes Compatibility

- Transform invalid Content ID URIs
- RFC2392: Use angle brackets in MIME headers

- Example:

`CID:<FFFF__=0ABBE548DFE147488f9e8a93d@coffeebean.com>`

- Strip angle brackets from URI

# iCal4j – Timezones

- iCalendar timezones are complex
  - Multiple recurrence / exclusion rules
- Simple Java timezones support a single offset for standard and daylight savings time
- JodaTime??
- Custom timezone backed by VTIMEZONE
- Timezone Registry (includes default definitions)
- Support for loading VTIMEZONE objects

# iCal4j – Timezones (Cont.)

- Globally unique identifiers ("/")
- Treat "well-known" identifier as globally unique
  - e.g. "Australia/Melbourne"
  - Associated issues (daylight savings)
- Alternate definitions available
  - True globally unique identifiers
    - e.g. `/ical4j_1_0_rc1/Australia/Melbourne`
  - Outlook compatible definitions
- Timezone Aliases
  - e.g. "US/Pacific=America/Los\_Angeles"

# iCal4j – Recurrences

## Applying VTIMEZONE definitions

- Iterate STANDARD / DAYLIGHT observances
- Calculate latest applicable Onset period
- Expand recurrences up to date instance
- Cache expanded Onsets

# iCal4j – Recurrences (Cont.)

## Calculating Recurrence Sets

- Expand recurrence / exception rules for a period
- Check for intersection with entire component duration
- Anniversary-style dates treated as zero-length periods
- May be normalised

# iCal4j – Other Features

- Parsing
  - Extensible architecture
  - Separation of parser and content handler
  - XML, microFormats, etc.
- Output
  - Deferred validation of object model
  - Enforce validation on output by default
  - Fold long lines

# iCal4j – Other Features

## Filters

- Alternative to VFREEBUSY
- Rule-based filtering:
  - Components with a specific Property
  - Components intersecting a specified Period

# iCal4j – Other Features

## Indexed Lists

- Useful for fast lookups
- Without indexing means repeatedly iterating over an object tree
- e.g. VEVENTs with a specified UID
- Not useful for smaller object models that change frequently

# iCal4j – Other Features

## Extension Objects

- Names starting with "X-"
- Currently only string values supported
- Improved integration with custom extension objects in future releases

# iCal4j – Other Features

## iTIP Validation

- Applied where METHOD property is present
- Mutual exclusion of components
- Additional component validation

# iCal4j – Future Directions

## Java 5 Features

- iCal4j 2.0
- Generics, Enums, etc.
- Improved typing, less casting
- Improved extension object support

# iCal4j – Future Directions

## iTIP / iMIP

- RFC2446 / 2447
- Object model transformations
  - Increment SEQUENCE, etc.
- JavaMail-based envelopes (??)

# iCal4j – Future Directions

## vCard

- Based on draft revision of vCard 4.0
- Integration with iCal4j
- Status: Parsing, output, some validation
- Additional Features:
  - Regular expressions for parsing
  - Enums for object identifiers
  - Registries for extension properties, parameters and groups
  - More robust object model

# iCal4j – Future Directions

## Connector

- Object Store access
- Support for CalDAV, CardDAV
- JCR (Indexed attachments, etc.)
- Higher-level than caldav4j

# iCal4j – Future Directions

- Synchronisation
  - Device calendar synchronisation
  - Open Mobile Alliance (SyncML) ??
- Android / J2ME

# iCal4j – Conclusion

<http://ical4j.sourceforge.net>